PHILOSOPHICAL TRANSACTIONS.

Monday, *Novemb.* 11. 1667.

The Contents.

A deſcription of an Inſtrument *for* Dividing a Foot into many thouſand parts, *and thereby* meaſuring the Diameters of Planets *to great exactneſs*, &c. *as it was formerly promiſed. An account of making a Dog draw his Breath juſt like a* Wind-broken *Horſe. Divers* Anatomical *Obſervations on* Humane *Bodies. Several Inſtances of* Peculiarities *of Nature, both in* Men *and Brutes. A Confirmation of the Experiments mentioned in* Numb. 27. *to have been made in* Italy, *by injecting* Acid Liquors *into* Blood. *An obſervation about the double Membrane called* Epiploon, *which covers the Entrails of Animals, and is filled with* Fat. *Some* Hortulan *Communications about the curious Engrafting of* Oranges *and* Lemons, *or* Citrons, *upon one anothers Trees, and of one* Individual *Fruit, half* Orange *and half* Lemon, *growing on ſuch Trees. An imitation of a way of preſerving, in the more* Northern *Climates*, Orange-trees *all Winter long, without any Fire. Enquiries for* Greenland. *An Account of the Synopſis NOVÆ PHILOSOPHIÆ & MEDICINÆ Franciſci Travagini*, Medici Veneti.

A Deſcription Of *an* Inſtrument *for* dividing a Foot into many thouſand parts, *and thereby* meaſuring the Diameters of Planets *to a great exactneſs*, &c. *as it was promiſed*, Numb. 25.

If the reſidence of the worthy Promiſer *of this* Inſtrument, *Mr.* Richard Townley, *had not been ſo remote from* London, *nor*

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ſome other Impediments intervened (after it was come to hand), Firſt on the Publiſher's, *then on the* Engraver's *ſide; the following Particulars concerning the ſame, promiſed ſome Months ago, had been imparted to the Publick a good while before this time: For the Draught of the* Figures, *repreſenting the* New Inſtrument *it ſelf, and the Deſcription of the ſame, we are obliged to the ingenuity of Mr.* Hook.

THe firſt, ſecond, and third *Figures* do repreſent the ſeveral parts of this Inſtrument; the fourth *Figure*, part of the *Teleſcope*, with the Inſtrument applied to it; and the fifth, the *Reſt*, on which the whole repoſeth.

The firſt *Figure* repreſents the *braſs Box* with the whole *Inſtrument*, (excepting only the *moveable Cover)* and the *Screws*, by which it is fixt to the *Teleſcope*. In this Figure *(a a a a)* is a ſmall oblong *braſs Box*, ſerving both to contain the *Screws*, and its *Sockets* or *Female Screws*, and alſo to make all the ſeveral moveable parts of the Inſtrument to move very true, ſmooth, and in a ſimple direct Motion. To one end hereof is ſcrewed on a *round Plate* of *Braſs (b b b b)* about 3 inches over; the extream *Limb* of whoſe outſide is divided into 100 *equal* parts, and numbred by 10, 20, 30, *&c.* Through the middle of this *Plate*, and the middle of the *Box (a a a)* is placed a very curiouſly wrought *Screw* of about the bigneſs of a Gooſe Quill, and of the length of the *Box*, the head of which is by a fixed *Ring* or *Shoulder* on the inſide, and a ſmall *ſpringing Plate (d d)* on the outſide, ſo adapted to the Plate, that it is not in the leaſt ſubject to ſhake. The other end of this *Screw* is by another *little Screw* (whoſe ſmall point fills the *Center* or hole made in the end of the *longer Screw* for this purpoſe) render'd ſo fixt and ſteady in the *Box*, that there appears not the leaſt danger of ſhaking. Upon the head of this *Screw* without the *ſpringing Plate*, is put on a ſmall *Index (e e)*, and above that a *Handle (m m)* to turn the Screw round as often as there ſhall be occaſion, without at all endangering the diſplacing of the *Index*, it being put on very ſtiff upon a *Cylindrical* part of the Head, and the Handle upon a Square. The Screw hath that *third* of it, which is next the Plate, bigger than the

the other *two Thirds* of it, by at leaſt as much as the depth of the *ſmall* Screw made on it: The *thread* of the Screw of the bigger *Third* is as ſmall again, as that of the Screw of the other *two Thirds*. To the *groſſer* Screw is adapted a Socket (*f*) faſten'd to a long Bar or Bolt (*g g*), upon which is faſten'd the *moveable* Sight (*h*), ſo that every turn of the Screw promotes the Sight (*h*) either a *thread* nearer, or a *thread* farther off from the fixt Sight (*i*). The Bar (*gg*) is made exactly equal and fitted into two ſmall Staples (*k k*), which will not admit of any ſhaking. There are 60 of theſe *threads*; and anſwerable thereto, are made 60 *diviſions* on the edge of the Bolt or Ruler (*g g*); and a ſmall *Index* (*l*) fixt to the Box (*a a a*) denotes, how many threads the edges of the two Sights (*h*) and (*i*) are diſtant; and the Index (*e e*) ſhews on the *Circular Plate* what part of a Revolution there is more, every Revolution, as was ſaid before, being divided into 100 parts. At the ſame time that the *moveable* Sight (*h*) is moved forwards or backwards, or more threads of the courſer Screw, is the Plate (*pp*. in *Fig*. 2.) by the means of the Socket (*q*) to which it is ſcrewed, moved forward or backward, or more threads of the finer Screw: So that this Plate, being fixt to the *Teleſcope* by the Screws (*r r*. in *Fig*. 2.) ſo as the middle betwixt the Sights may lye in the *Axis* of the Glaſs, however the Screw be turn'd, the midſt betwixt the Sights will always be in the *Axis*, and the Sights will equally either open from it, or ſhut towards it.

Fig. 2. repreſents the *moveable* Cover containing the Screws, to be by the Bookſeller cut off by the pricked Line (*x x x*) from the Paper, and to be fitly placed on *Figure* 1. according to the pricked Line (*y y y*) anſwering thereto; that by the taking off, as it were, or folding up of this Cover, the *inward* contrivance of the Screws and Sights may appear.

And becauſe it is conceived by ſome ingenious Men, that it will be more convenient, inſtead of the Edges of the two Sights (*h* and *i*) to employ *two* Sights fitted with Hairs, therefore is added *Figure* 3. repreſenting the two Sights (*r* and *s*) ſo fitted with Threads (*t* and *u*) that they may be conveniently uſed in the place of the *ſolid* Edges of the Sights (*h* and *i*).

The fourth *Figure* repreſents, How the *Screws* are to be put on.

The *Tube* AD is divided into 3 lengths, of which (as in ordinary ones) B C is to lengthen or contract, as the Object requires: But A B is here added, that at A you may put ſuch *Eye-Glaſſes* as ſhall be thought moſt convenient, and to ſet them ſtill at the diſtance moſt proper for them, *Indexes* or *Pointers,* which here are ſuppoſed to be at B, which length alters alſo in reſpect of divers perſons Eyes. E is a Screw, by which the great *Tube* can be fixt ſo, as by the help of the Figures any ſmaller part of it can immediately be found, meaſuring only, or knowing the Diviſions on B C, the diſtance of the *Object-glaſs* from the *Pointers.* F is the *Angular* piece of Wood, that lies on the upper Screw of the *Reſt.* This *Reſt* is repreſented by *Fig.* 5.

As for a Deſcription of the *Uſes* of this ingeniouſly contrived and very curious *Engine,* the Reader is deſired to look back to the before-alledged *Numb.* 25.

An Account

Of making a Dog *draw his Breath exactly like a* Wind-broken Horſe, *as it was deviſed and experimented by Dr.* Richard Lower; *with ſome of his* Inſtructive *Obſervations thereon.*

This Experiment was made before the Royal Society, Octob. 17. 1667. *after it had been tried by the Author in private ſome while before. The Account of it in his own words, is as follows.*

AFter I had often conſidered the *manner* and way of *Reſpiration,* and by many Obſervations been induced to believe, that the *Diaphragme* is the chief *Organ* thereof, I thought there could be no way more probable to try it, than by breaking the *Nerves,* by which its Motion is perform'd; which may be eaſily (as it was actually) done after the following manner.

Firſt, pierce the ſide of the Animal between the *6th* and *7th* Rib in the middle of the *Thorax,* juſt over againſt the Region of the Heart, with a ſmall *Inciſion-knife,* paſſing the Knife but juſt into the Cavity of the Breaſt (which you may juſtly know by finding no reſiſtance to the point of it); then take it out, and put in a *Director,* or a ſmall Quill made like it, and thruſt it in about an inch, directing the end of it toward the *Sternum,* cloſe to the inſide of the Breaſt. Then cut upon it about an inch on the *Intercoſtal* Muſcles; by which you may be ſecur'd from touching the

Lungs

Print, giving a brief Account of the Contents of the ſaid Treatiſe to this effect, *viz.*

That this Author hath compos'd a *Syſtem* of Natural Philoſophy by Obſervations and Experiments, accommodated to the benefit of Humane Life, and ſubſervient to *Phyſick* and other *ſubalternate* Arts; which *Philoſophy* he pretends to have raiſed on *Principles* that are certain Bodies drawn out of *Mixts*; which, though in themſelves inviſible and incoagulable, yet become, according to him, viſible by their Contrariety and mutual Operation upon one another, and ſo do conſtitute the Temperaments of Concretes, and cauſe not only their Diſſolution, but alſo their Redintigration.

Theſe *Principles* he undertakes to prove to be *Two Salts*, call'd by him *Acidum* and *Salſum*; which, as they work more or leſs on one another, when blended, ſo they loſe more or leſs of their Volatility, and the degrees of their Contrariety: And from their various Complication (in which he places the whole buſineſs and moment of *Philoſophy*) he holds, that that great multiplicity of Concretes, which is in the *Univerſe*, does reſult.

In particular, he deduceth from the ſaid *Principles* the cauſe of *Ferments* and their variety, the nature of *Generations*, *Concretions*, *Putrefactions*, *Precipitations*, *&c.* and ſheweth how thoſe *Principles* run through all *Minerals*, *Vegetables*, and *Animals*, by their manifold Combinations, and various ways of acting on one another.

He explains alſo the mixtures of *Alkaly's*, *Vitriols*, *Armoniacks*, *Sulphurs*, *Mercuries*, and explicateth the properties of *Diſſolvents*; as alſo *Taſts*, *Odours*, *Colours*, *&c.* all from the ſame Principles.

And having raiſed this Structure of his as far as he judgeth it ſufficient for *Subordinate* Arts, he proceeds to adapt it to the Art of *Phyſick*. And applying it to *Animal* Bodies, he thence draws the diverſity of Humours and Tempers, the beginning and duration of Vital Heat, the motion of the Limbs, the faculties of Entrails, the origin, vitality, and properties of the Blood, and the various Fermentations therein; ſhewing the Diſtempers of the Ferments and Juices in Animals, the nature of Coagulations, Diſſolutions, Feavers, and other Symptoms; as alſo the original of Poyſons in Animal Bodies; concluding with an Indication of the proper Remedies (as he conceives) of many Diſeaſes.

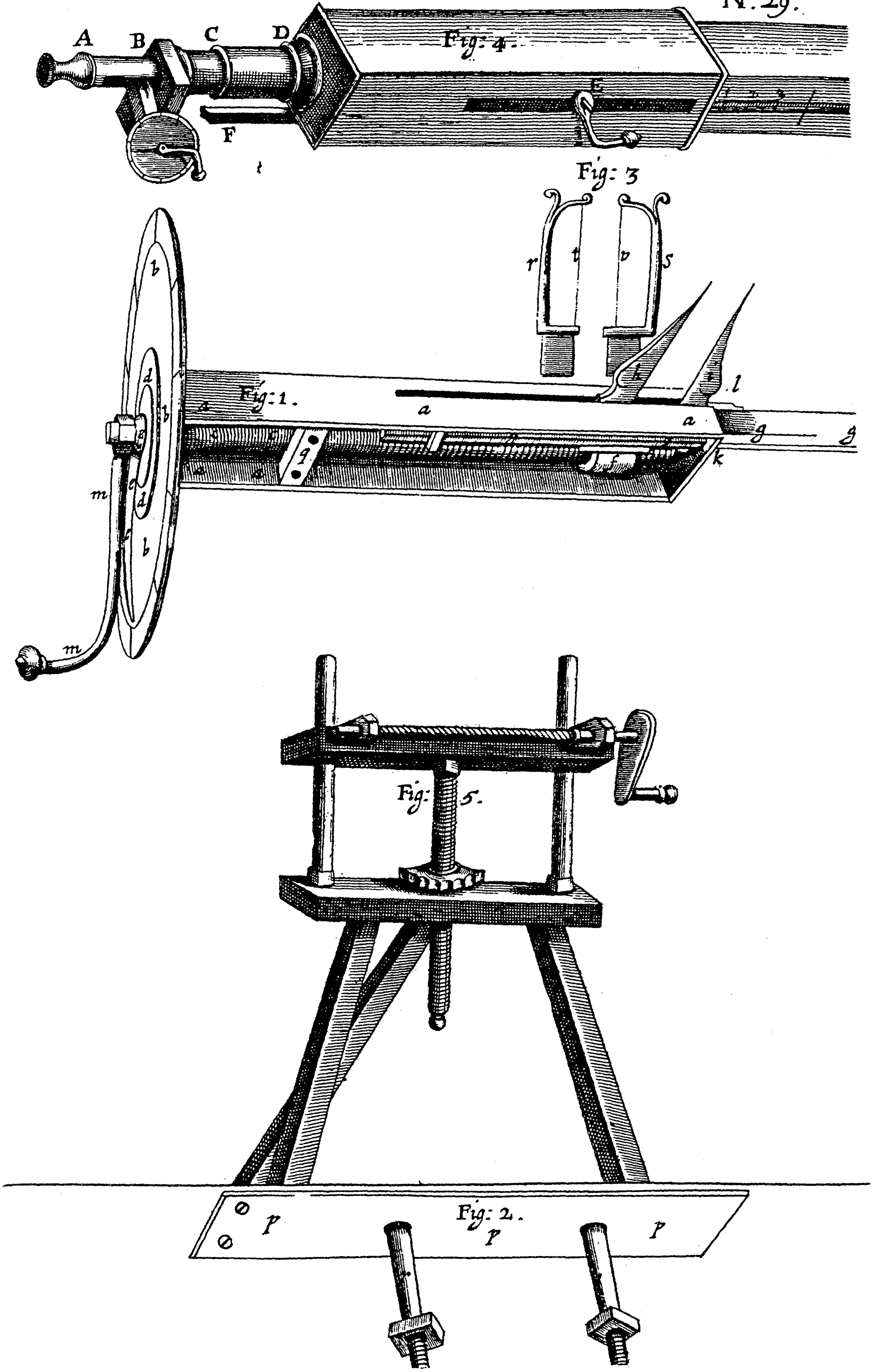
Whether this Philoſophy be new, *is eaſie to judge.*

A Note to be inſerted above, pag. 544. *after line* 12.

This *Reſt* (by Mr. *Hook*'s ſuggeſtion) may be render'd more convenient, if, inſtead of placing the Screw *Horizontal*, it be ſo contriv'd, that it may be laid *parallel* to the *Equinoctial*, or to the *Diurnal* Motion of the Earth; for by that means the ſame thing may be perform'd by the ſingle motion of *one* Screw, which in the other way cannot be done but by the turning of *both* Screws: As will eaſily appear to thoſe that ſhall conſider it.

In the *SAVOY*,
Printed by *T. N.* for *John Martyn*, Printer to the *Royal Society*, and
are to be ſold at the *Bell* a little without *Temple-Bar*, 1667.

N°. 29.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